

September 12, 2003

TO: Internal File

FROM: Peter H. Hess, Environmental Scientist III/Engineering, Team Lead

RE: Methane Degasification Wells, G-1, G-2, G-3, Canyon Fuel Company, Dugout Canyon Mine, C/007/039, Task ID#1642

SUMMARY:

The permittee submitted a proposal to the Division on August 1, 2003 to permit the potential drilling of one to three methane degasification boreholes at the Dugout Canyon Mine. The purpose of the holes is to enhance the coal extraction process from the longwall panel located in Section 24 of Township 13 South Range 12 East and Section 19 of Township 13 South Range 13 East. The wells will provide additional venting/dilution potential for the mine's ventilation system. The permittee's intent is to drill hole G-3 first, and then proceed, if needed for additional venting capability, with the drilling of G-2 and G-1.

All surface lands are leased by the permittee from the Milton and Ardith Thayn Trust. Coal ownership is under the U.S. Department of the Interior, Bureau of Land Management in Section 24. The coal ownership in Section 19 is under the BLM and the State of Utah, School and Institutional Trust Lands Administration.

TECHNICAL ANALYSIS:

GENERAL CONTENTS

IDENTIFICATION OF INTERESTS

Regulatory Reference: 30 CFR 773.22; 30 CFR 778.13; R645-301-112

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Analysis:

The Identification of Interest information is in the Mining and Reclamation Plan, Chapter 1, page 1-2. This information was revised in January of 2000. The information has not changed.

The corporate officers have not changed.

All surface ownership in Section 24 and all surface ownership in Section 19 relative to the three proposed well locations is held by the heirs of the Milton and Ardith Thayn Trust.

A review of Plate 1-2, as contained in the approved mining and reclamation plan for the Dugout Canyon Mine, indicates that all coal ownership in Section 24 is by the United States of America (USA). Coal ownership in Section 19 is held by the USA as well as the State of Utah. All coal located beneath the proposed locations for wells G-3, G-2, and G-1 is Federal coal.

The wells are located within the currently approved mine permit area. The owners of record for surface and mineral properties contiguous to the proposed permit area are the USA, Department of the Interior, Bureau of Land management, and the State of Utah, School and Institutional Trust Lands Administration, (See **Chapter 1**, page **1-4**, section **112.600**).

The U.S. Department of Labor, Mine Safety and Health Administration has issued three identification numbers relative to the Dugout Canyon Mine; these are:

- 1) MSHA No. 42-01890 for the Gilson seam on the west side of the Canyon,
- 2) MSHA No. 42-01888 for the Gilson seam on the west side of the Canyon, and
- 3) MSHA No. 1211-UT-09-01890-01 Dugout Canyon Mine Refuse Pile.

All are contained in **Chapter 1**, page **1-19**, Section **112.700 MSHA Numbers** of the approved mining and reclamation plan.

Chapter 1, page **1-4**, section **112.800 Interest in Contiguous Lands** of the methane well submittal indicates that Canyon Fuel Company, LLC has no interest in contiguous lands other than those currently owned as shown on Plate 1-1 of the approved M&RP.

Findings:

The submitted information meets the minimum regulatory requirements of this section.

VIOLATION INFORMATION

Regulatory Reference: 30 CFR 773.15(b); 30 CFR 773.23; 30 CFR 778.14; R645-300-132; R645-301-113

Analysis:

The permittee submitted new corporate violation information to address the requirements of this section on September 10, 2003. The new information has been submitted for incorporation into the Dugout Canyon Mine mining and reclamation plan, upon approval of the degasification well amendment. The required information is contained in Chapter 1, pages 1-21, 1-22, and 1-23A-R. The information was previously updated in January of 2003.

The newly submitted information contains the violation information for all of the ARCH Coal, Incorporated operations. All corporate violations that are pending exist at ARCH operations in the States of West Virginia or Virginia. There are no outstanding violations relative to ARCH's Canyon Fuel Company operations in the State of Utah.

Findings:

The submitted information meets the minimum regulatory requirements.

RIGHT OF ENTRY

Regulatory Reference: 30 CFR 778.15; R645-301-114

Analysis:

The permittee has included, as part of the application (**ATTACHMENT 4-2**), the surface landowners agreement between the heirs of the Milton and Ardith Thayn Trust and the permittee. Based on a review of **EXHIBIT "A" to Surface Use Agreement, Thayn Lands**, include all surface in Section 24, as well as all surface associated with Section 19, with the exception of Lot 4.

The surface of Lot 4 is owned by the United States of America. The legal description of Lot 4 would be the W1/2 of the S1/2 of SW1/4 of Section 19. Well G-3 is located in the N1/2SW1/4NW1/4 of Section 19.

Findings:

The permittee's surface land use agreement allows them the proper right of entry to drill wells G-1, G-2, and G-3.

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LEGAL DESCRIPTION AND STATUS OF UNSUITABILITY CLAIMS

Regulatory Reference: 30 CFR 778.16; 30 CFR 779.12(a); 30 CFR 779.24(a)(b)(c); R645-300-121.120; R645-301-112.800; R645-300-141; R645-301-115.

Analysis:

TABLE 1-1. DeGas Well Locations, Pine Canyon, Utah Quadrangle, Salt Lake Meridian as depicted on Page 1-1 of the submittal provides the legal descriptions for methane degasification wells G-1, G-2, and G-3. PLATE 1-4, included with the submittal depicts the three well locations as they relate to the permit boundary for the Dugout Canyon Mine. Therefore, the need for the applicant to address that the permit area is within an area designated as unsuitable for mining is unnecessary. The well locations exist within the area that has been permitted for coal extraction.

Findings:

The minimum regulatory requirements have been addressed.

PERMIT TERM

Regulatory References: 30 CFR 778.17; R645-301-116.

Analysis:

The current State of Utah mining permit issued by the Division of Oil, Gas and Mining was renewed on March 3, 2003. Same remains in affect until March 16, 2008. The proposal to drill the three methane degasification wells for the Dugout operation has been received during the current permit term.

Findings:

The minimum regulatory requirements have been met.

PUBLIC NOTICE AND COMMENT

Regulatory References: 30 CFR 778.21; 30 CFR 773.13; R645-300-120; R645-301-117.200.

Analysis:

The proposal to permit and drill the three methane degasification wells at the Dugout Mine will occur on private surface land managed by the heirs of the Milton and Ardith Thayn Trust. The permittee has included, as part of the application, a copy of the surface lease agreement between the Trust and Canyon Fuel Company. There is no need for a public notice and comment period.

Findings:

The requirements of this regulation are not relative to this application.

FILING FEE

Regulatory Reference: 30 CFR 777.17; R645-301-118.

Analysis:

The proposal to drill the three methane de-gasification wells is not a permit application, but is an amendment to the currently approved mining and reclamation plan.

Findings:

This requirement is not relative to this permit amendment.

PERMIT APPLICATION FORMAT AND CONTENTS

Regulatory Reference: 30 CFR 777.11; R645-301-120.

Analysis:

This proposal is an amendment or modification to the currently approved mining and reclamation plan, which is an integral part of the permit. The determination that the permit application consisted of the proper format and adequately addressed the requirements of the disciplines relative to completeness was made prior to the receipt of this application.

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Findings:

A determination that the permit application was administratively complete was made prior to receipt of this amendment. This requirement is not relative.

MAPS AND PLANS

Regulatory Reference: 30 CFR 777.14; R645-301-140.

Analysis:

All maps and plans that have been submitted with the application which are relative to well location, pad design, hydrology, or engineering design are certified by a Utah registered professional engineer.

Findings:

The minimum regulatory requirements have been addressed.

COMPLETENESS

Regulatory Reference: 30 CFR 777.15; R645-301-150.

Analysis:

The permittee's initial application to permit three degasification wells for the Dugout Mine long-walling system was received on August 1, 2003. Three additional submittals containing revised or additional information were made on August 28th, September 4th, and September 10, 2003. The provided information is felt to be complete and adequate, as all disciplines have made a recommendation for approval of the amendment.

Findings:

The provided information meets the minimum regulatory requirements for completeness.

OPERATION PLAN

MINING OPERATIONS AND FACILITIES

Regulatory Reference: 30 CFR 784.2, 784.11; R645-301-231, -301-526, -301-528.

Analysis:

The purpose of the proposed methane de-gasification wells is to enhance the venting/dilution capability of the mine's ventilation system, such that dangerous levels of methane gas are not allowed to accumulate within the gob area (area where the coal seam has been extracted and the roof has been allowed to cave) and/or the bleeder entries. It is the permittee's intent to have the wells permitted, and then drill them, if it is decided that they are needed. At the present time, only minor delays have been experienced from methane buildup as the current longwall panel is being extracted. The permittee has verbally indicated that the wells will not be drilled as sequenced. If the permittee concludes that the additional venting capability is necessary, well G-3 will be the first to be put down. If additional capability is needed, well G-2 will be drilled, and so on. At the present time, six wells are being considered; however, only wells G-1, G-2, and G-3 are being permitted at this time.

As depicted on FIGURE 5-16, TYPICAL WELL DESIGN, the wells will be drilled to depths such that the hole bottom will stop twenty-five feet above the roof elevation of the Gilson coal seam. Depending on the amount of overburden at the specific well site, the well depths could vary from 1250 to 2050 feet.

Chapter 6, Geology, page 6-2, section **625**, states "it is not anticipated that any additional geologic data will need to be collected at the well sites". Section **624.300** also states "no test boring(s) or drill cores are planned at the site". Therefore, none of the coal seam will be extracted for analysis. The wells will be permitted as a mining related activity under the R645 coal rules.

None of the methane wells will be plugged post drilling, as their purpose is to bleed off the combustible gases within the mine, improving safety conditions and mining productivity. The anticipated life/usage of the degasification hole(s) is unknown at this time.

Findings:

The amendment does not qualify as a minor coal exploration amendment, and therefore, same will be reviewed as an amendment to the mining and reclamation plan.

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EXISTING STRUCTURES:

Regulatory Reference: 30 CFR 784.12; R645-301-526.

Analysis:

The proposal to construct the methane degasification wells will occur in an area well outside of the disturbance created by the mine's facilities. There are no known dwellings, public buildings, schools, churches, or community buildings within 1,000 feet of the pre-determined well locations. There is no indication that blasting will be done during the construction/reclamation process of the well sites. This regulation is not applicable.

Findings:

There are no known structures in the area of the methane well development sites. This regulation is not applicable.

PROTECTION OF PUBLIC PARKS AND HISTORIC PLACES

Regulatory Reference: 30 CFR 784.17; R645-301-411.

Analysis:

There are no public parks in the area where the three wells are being proposed. Archaeological surveys of the well sites were conducted in June of 2003; with nothing being found that required future investigation. There are no cemeteries, or units of the National System of Trails or the Wild and Scenic Rivers System located within the wells site boundaries, (See report included as Attachment 4-1).

The permittee has agreed to notify the Utah State Historic Preservation Office of previously unidentified cultural resources discovered during the course of operations of the wells.

Findings:

The submitted information is adequate to meet the minimum regulatory requirements of this section.

RELOCATION OR USE OF PUBLIC ROADS

Regulatory Reference: 30 CFR 784.18; R645-301-521, -301-526.

Analysis:

All access roads within the surface lease agreement area are owned by the surface landowners, the heirs of the Milton and Ardith Thayne Trust. There are no public roads involved in the submittal.

Findings:

This regulation is not applicable to this submittal.

AIR POLLUTION CONTROL PLAN

Regulatory Reference: 30 CFR 784.26, 817.95; R645-301-244, -301-420.

Analysis:

The permittee's submittal commits to watering of the access roads (both the private surface roads as well as the portions to be constructed. See Chapter 4, page 4-4, section **424, Fugitive Dust Control Plan**. The application of water will be of sufficient frequency and quantity to maintain the surface material in a damp/moist condition unless it is below freezing.

Findings:

The submitted information meets the minimum regulatory requirements of this section.

COAL RECOVERY

Regulatory Reference: 30 CFR 817.59; R645-301-522.

Analysis:

As stated previously, the methane wells will be drilled to depths varying from 1250 to 2050 feet, depending on the amount of overburden at the well location. All boreholes will be stopped at a depth that correlates to twenty-five feet above the roofline elevation of the Gilson coal seam. No coal will be recovered from the seams that are being mined within the Dugout Mine permit area. No test borings or drill cores are planned at the well sites.

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Findings:

This regulation is not applicable to this amendment.

SUBSIDENCE CONTROL PLAN

Regulatory Reference: 30 CFR 784.20, 817.121, 817.122; R645-301-521, -301-525, -301-724.

Analysis:**Renewable Resources Survey**

A discussion relative to **Structures and Renewable Resource Lands** is included as part of Chapter 5, page 5-27 of the Dugout Canyon Mine mining and reclamation plan. Same indicates that there are no major electrical transmission lines, pipelines, or agricultural drainage tile fields within the area to be extracted using long wall mining methods. All roads in sections 19 and 24 are the private property of the heirs of the Milton and Ardith Thayn Trust. As previously mentioned, the permittee has been granted use of these roads via the surface lease agreement between Canyon Fuel Company and the heirs of the Milton and Ardith Thayn Trust.

Subsidence Control Plan

Chapter 5, page 5-7, section **525 Subsidence** of the application indicates “no subsidence will occur at the well sites, as a result of drilling and development of the degasification well sites. Subsidence could occur at the well site because of underground mining...” The application references Section 525 of the approved mining and reclamation plan.

As the long wall panel is extracted from the Gilson seam, the roof will cave behind the shields as the face is mined and the shields are advanced. Although the broken material will swell to a certain extent as it breaks and falls, some settling of material will propagate to the surface, and the elevation of all surface over the extracted panel will be diminished.

Subsidence Monitoring is discussed on pages 5-28 through 5-31 of the approved mining and reclamation plan. The commitment made by the permittee on page 5-30 is to install one monitoring point per panel. According to Ms. Vicki Miller on August 13, 2003, a new marker to monitor the panel associated with the three proposed gob vent boreholes has been surveyed adjacent to well location G-3. The marker has yet to be installed as of the date of writing this technical memo. Although the installation of the monitoring point is not necessary relative to a

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recommendation for approval of the installation of the methane wells, the permittee should ensure that the subsidence monitoring survey point is installed prior to initiation of the panel extraction process.

Performance Standards For Subsidence Control

The permittee has an approved subsidence control plan in place, as evidenced via review of the approved mining and reclamation plan.

Notification

Chapter 5, page 5-34, section **525.300 Public Notice of Proposed Mining**, indicates that “each owner of property or resident within the area above an underground mining block and adjacent area that may be affected by subsidence will be notified by mail at least six months prior to mining or within that period if approved by the Division”. That notification will include 1) the identification of specific areas in which mining will take place, 2) dates the specific areas will be undermined, and 3) the location or locations where the Dugout Canyon Mine subsidence control plan may be examined.

Findings:

The information provided meets the minimum regulatory requirements of this section.

ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES

Regulatory Reference: 30 CFR Sec. 784.24, 817.150, 817.151; R645-301-521, -301-527, -301-534, -301-732.

Analysis:

Road Classification System

The privately owned access roads will remain in place after the venting phase of each of the wells is completed. The road lengths that will be constructed to access each of the well sites are classified as “primary” and will be reclaimed upon the final reclamation of the well sites. FIGURE 5-14, TYPICAL ACCESS ROAD CROSS SECTION depicts the basic design that will be used to construct the roadway lengths that are necessary to access the methane well pads. A roadway width of twenty feet will be cut/filled in the following lengths; G-1 will have a fifty-five foot access road development length. G-2 access will require a 370-foot roadway development length. G-3 will require a ninety-foot roadway length. FIGURE 5-14 is P.E. certified by Mr. Layne Jensen, Utah registered professional engineer.

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Plans and Drawings

The application contains a typical road cross section for the lengths of access which require construction, FIGURE 5-14. The drawing depicts an access roadway width of twenty feet, showing a road cut. The drawing is P.E. certified by Mr. Layne Jensen, Utah registered professional engineer.

Plan views of the “to be constructed” access road lengths are depicted on FIGURES 5-1, 5-5, and 5-9. These are the contour maps for wells G-1, G-2, and G-3. All figures are P.E. certified by a Utah registered professional engineer.

Primary Road Certification

The permittee’s application classifies all of the roadway lengths that require construction to access the wells as primary. The roads will have surface constructed of compacted native subsoil material. The roads are depicted on FIGURES 5-1, 5-5, and 5-9; the figures are the contour maps for wells G-1, G-2, and G-3. All roadway lengths that are developed as access to the well pad locations will be reclaimed upon the completion of the methane venting process.

Findings:

The information provided meets the minimum regulatory requirements of this section.

SPOIL AND WASTE MATERIALS

Regulatory Reference: 30 CFR Sec. 701.5, 784.19, 784.25, 817.71, 817.72, 817.73, 817.74, 817.81, 817.83, 817.84, 817.87, 817.89; R645-100-200, -301-210, -301-211, -301-212, -301-412, -301-512, -301-513, -301-514, -301-521, -301-526, -301-528, -301-535, -301-536, -301-542, -301-553, -301-745, -301-746, -301-747.

Analysis:**Disposal Of Noncoal Mine Wastes**

All noncoal waste generated by the well drilling activities will be disposed of in the same manner as waste generated at the main mine facilities area.

There will be no noncoal waste disposal areas at any of the proposed well sites.

Coal Mine Waste

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Chapter 5, page 5-3, section 513.300 Underground Development Waste, Coal Processing Waste, and Excess Spoil addresses this requirement. None of these types of material will exist at the well sites.

Refuse Piles

No refuse piles will exist at the well sites, (Chapter 5, page 5-15, Section **553.250, Refuse Piles**).

Impounding Structures

“No impoundments will exist at the well sites, “ (See **Chapter 5**, page **5-4**, section **515.200 Impoundment Hazards** of the submittal).

Burning And Burned Waste Utilization

This section is not applicable to this submittal.

Return of Coal Processing Waste to Abandoned Underground Workings

No coal processing waste will be generated within the well sites, (Chapter 5, page 5-15, section **553.200 Spoil and Waste**).

Excess Spoil:

This section is not applicable to this submittal.

Findings:

The permittee has addressed those sections that are felt to be relevant to the proposed drilling of the three methane vent wells. The submitted information is adequate to meet the minimum regulatory requirements of this section.

SUPPORT FACILITIES AND UTILITY INSTALLATIONS

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Analysis:

The proposed methane vent wells are intended to enhance the mine ventilation system, allowing additional venting and dilution capability for the combustible mine gases that are inherent in the coal seam, as well as the adjacent strata. Thus, they are a support facility.

Chapter 5, page 5-8, section **526.200 Utility Installation and Support Facilities** of the submittal addresses this requirement. According to that information, no utilities will be installed at the well sites. A portable methane-exhausting unit will be installed, and the operation of that machine will be initiated with portable propane bottles. Upon start up, the device will be switched over to operate from the methane concentrations venting from the well, and will thus be self-sufficient.

Findings:

The information provided meets the minimum regulatory requirements of this section.

SIGNS AND MARKERS

Regulatory Reference: 30 CFR Sec. 817.11; R645-301-521.

Analysis:

Chapter 5, page 5-6, Section 521.100, Signs and Markers addresses this requirement of the R645 coal rules. The application commits the permittee to install a mine and permit identification sign at each well site that is developed. The identification sign will contain the following information: Mine name, Company name, Company address and telephone number, MSHA identification number, and the permanent program identification number.

The application commits the permittee to install disturbed area perimeter markers to identify all acreage to be affected before beginning mining activities.

Stream buffer zone signs will not be required at any of the proposed well sites.

Topsoil storage signs will be placed on all topsoil stockpiles.

All signs and markers will be maintained until no longer needed, generally until all Phase III bond release requirements have been met.

Findings:

The information provided meets the minimum regulatory requirements of this section.

MAPS, PLANS, AND CROSS SECTIONS OF MINING OPERATIONS

Regulatory Reference: 30 CFR Sec. 784.23; R645-301-512, -301-521, -301-542, -301-632, -301-731, -302-323.

Analysis:

Mining Facilities Maps

The methane well submittal includes four maps/drawings for each of the three wells that are being proposed; these include:

- 1) A contour map, which depicts the undisturbed surface contour, and the relationship of the well pad.
- 2) A typical cross section for each well pad, depicting the pre-disturbed and final reclamation surface configuration, as well as the Operational surface configuration.
- 3) A plan view of the “approximate” drilling layout for each of the proposed well sites. The plan view shows the various method to control and treat intercepted precipitation, including sloping the pad(s), installation of berms and silt fences.
- 4) The fourth figure included with the series for each of the proposed well sites depicts the “approximate” operational layout for the venting process of the well. These figures also depict the reclaimed portion of each well.

All four figures for each of the three proposed wells are P.E. certified by Mr. Layne Jensen, Utah registered professional engineer.

Mine Workings Maps

Not applicable to this amendment.

Monitoring and Sampling Location Maps

All maps relative to this requirement are incorporated into the approved mining and reclamation plan for the Dugout Canyon Mine.

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Certification Requirements

As noted above, all plans, drawings, and maps that are relative to this submittal have been certified by a Utah registered professional engineer.

Findings:

The submitted information is adequate to meet the minimum regulatory requirements of this section.

RECLAMATION PLAN**GENERAL REQUIREMENTS**

Regulatory Reference: PL 95-87 Sec. 515 and 516; 30 CFR Sec. 784.13, 784.14, 784.15, 784.16, 784.17, 784.18, 784.19, 784.20, 784.21, 784.22, 784.23, 784.24, 784.25, 784.26; R645-301-231, -301-233, -301-322, -301-323, -301-331, -301-333, -301-341, -301-342, -301-411, -301-412, -301-422, -301-512, -301-513, -301-521, -301-522, -301-525, -301-526, -301-527, -301-528, -301-529, -301-531, -301-533, -301-534, -301-536, -301-537, -301-542, -301-623, -301-624, -301-625, -301-626, -301-631, -301-632, -301-731, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-732, -301-733, -301-746, -301-764, -301-830.

Analysis:

Upon completion of the drilling activities, all machinery will be removed and the mud pits backfilled and compacted. Approximately 60 to 70% of each disturbed acreage will be reclaimed by returning it to approximate original contour, (See Chapter 5, page 5-10, section **537.200, Regrading of Settled and Revegetated Fills**), roughening, and reseeding the area. An exhaust blower will be set up to create a low pressure area across the well head, allowing the combustible mine gases to vent to the atmosphere. This will remain at the site for the length of the life of the well.

Upon completion of the venting phase, the blower and wellhead will be removed and the well casing will be plugged to the maximum depth possible. Final reclamation activities will commence, returning the remaining disturbed area to approximate original contour. Revegetation activities will commence; the only remaining equipment will be the disturbed area perimeter fence, and the permittee identification sign, which will remain until authorization is granted by the Division to remove same.

Findings:

The minimum regulatory requirements have been addressed.

POSTMINING LAND USES

Regulatory Reference: 30 CFR Sec. 784.15, 784.200, 785.16, 817.133; R645-301-412, -301-413, -301-414, -302-270, -302-271, -302-272, -302-273, -302-274, -302-275.

Analysis:

Chapter 5, page 5-15, section **553.100 Disturbed Area Backfilling and Grading, Post-Mining Land Use** indicates, “the disturbed area will be reclaimed in a manner that supports the approved post-mining land use. Refer to Sections 411 and 412 for additional detail.”

Chapter 4, page 4-1, section **411.100 Pre-mining Land Use** of the submittal indicates, “the area is utilized for the landowners private use and as open range for livestock and wildlife.” The area is also zoned by Carbon County for “mining and grazing, (MG-1)”, (See section **411.130 Land Use Description**, Chapter 4, page 4-1 of the submittal). “There are no industrial or municipal facilities located on or immediately adjacent to the well sites.”

Chapter 4, page 4-2, section **412.100 Post Mining Land Use Plan** indicates that the permittee will conduct all activities in the area such that “all uses of the land prior to the wells construction/operation and the capacity of the land to support prior alternate uses will remain available throughout the life of the sites. Dugout Canyon intends (for) the post mining land use to be livestock and wildlife grazing. Final reclamation activities will be completed in a manner to provide the lands able to parallel the pre-mining land use.” Thus, the permittee intends to conduct all mining operations in a manner such that the post-mining land use and the pre-mining land use are identical.

Findings:

The submitted information is adequate to address the minimum regulatory requirements of this section.

APPROXIMATE ORIGINAL CONTOUR RESTORATION

Regulatory Reference: 30 CFR Sec. 784.15, 785.16, 817.102, 817.107, 817.133; R645-301-234, -301-412, -301-413, -301-512, -301-531, -301-533, -301-553, -301-536, -301-542, -301-731, -301-732, -301-733, -301-764.

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Analysis:

Upon completion of the drilling phase of the well(s), approximately 60-70% of the disturbance(s) will be reclaimed by regrading that portion to approximate original contour, (See Chapter 5, page 5-14, section **553.100 Disturbed Area Backfilling and Grading, Approximate Original Contour**) roughening the area to enhance moisture retention and re-seeding the area with the seed mix approved by the Division. See page 5-9, Chapter 5, section **537.200, Regrading of Settled and Revegetated Fills**. As indicated, "upon completion of the well site, the areas not required for the exhaust blower will be regraded to approximate original contour". If any settling should occur within the reshaped area, the permittee's submittal makes the commitment to regrade the settled areas. After the venting phase of the degasification wells has been completed, the remainder of the disturbance will be reclaimed, returning the acreage associated with venting phase to approximate original contour. This will be followed by roughening and reseedling of the area. The disturbed area perimeter fence and the associated permittee identification signs will remain in place until the Division has made a determination that all reclamation standards have been adequately addressed.

Findings:

The submitted information meets the minimum regulatory requirements of this section.

BACKFILLING AND GRADING

Regulatory Reference: 30 CFR Sec. 785.15, 817.102, 817.107; R645-301-234, -301-537, -301-552, -301-553, -302-230, -302-231, -302-232, -302-233.

Analysis:**General**

See previous analysis under **APPROXIMATE ORIGINAL CONTOUR RESTORATION**.

Previously Mined Areas

The area has not been mined previously; the requirements of this section are not applicable to the methane well submittal.

Backfilling and Grading On Steep Slopes

Chapter 4, page 4-1, section **411.120 Land Capability** indicates, “the well site areas are located on the flatter mesa tops and rolling terrain”. A review of FIGURES 5-1, 5-5, and 5-10, which are contour maps for each of the respective well sites, reveals that, based on the determination of the slope gradient that none of the well sites surface increase in elevation at an angle steeper than 12 degrees. By definition, steep slopes are slopes that increase in height when the vertical angle is twenty degrees or more. Therefore, none of the well sites are being proposed in what would be considered a steep slope area.

Special Provisions for Steep Slope Mining

This requirement is not applicable to this submittal.

Findings:

The information submitted meets the minimum regulatory requirements of this section.

MINE OPENINGS

Regulatory Reference: 30 CFR Sec. 817.13, 817.14, 817.15; R645-301-513, -301-529, -301-551, -301-631, -301-748, -301-765, -301-748.

Analysis:

Reclamation of the methane vent wells is addressed in Chapter 5; section **540 RECLAMATION PLAN**, section **550, RECLAMATION DESIGN CRITERIA AND PLANS**, and section **560, PERFORMANCE STANDARDS**.

Section **541.100, Commitment** indicates, “Upon permanent cessation of methane venting, Dugout Canyon Mine will seal the wells and permanently reclaim all affected areas in accordance with the R645 regulations and this reclamation plan.”

The sealing of wells involves meeting the minimum regulatory requirements associated with R645-301-765. Page 7-13, **Chapter 7, HYDROLOGY**, section **748, Casing and Sealing Wells**, refers one to **Chapter 5, ENGINEERING**, section **542.700, Final Abandonment of Mine Openings and Disposal Areas** that states, “All openings will be sealed in accordance with Federal and State Regulations. The casings will be plugged at the bottom to hold concrete. A lean concrete mixture will be poured into the casing until the concrete is within five (5) feet of the surface. At that time, the casing will be cut off at ground level and the rest of the casing will

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be filled with lean concrete. The concrete will be allowed to harden before the final reclamation is completed.”

Methane degasification wells are unique in that they are drilled to a depth that is approximately twenty-five feet above the coal seam that is being extracted. As the longwall face retreats and extracts the coal from the area beneath the borehole, the roof caves as the longwall shields are advanced in order to protect the machinery. Hopefully, the roof caves up to the bottom of the degasification well, completing the circuit, and allowing atmosphere containing mine gases to be vented to the surface. An exhaust blower will sit on the surface creating a low pressure across the wellhead, pulling the mine gases from the underground gob area.

It is generally accepted that more than 90% of the subsidence associated with coal extraction via longwall mining methods will occur within the first year after completion of the extraction process. The casing of the methane vent well may be subjected to crushing or shearing anywhere along its length, due to the shifting, bending and/or breaking of the strata adjacent to the well. Thus, the venting of combustible gases from the gob areas of the mine may be short lived. The plugging of these casings may only be effective in preventing adverse environmental or health and safety effects to a certain extent. The prevention of cross contamination of aquifers may not be possible in consideration of the fact that the plugging of the hole may not be possible for its entire depth.

Findings:

The permittee has committed to plugging the degasification well casings to the extent possible to prevent adverse environmental damage or possible effects to health and safety. This commitment is the best that can be given at this point in time, as only the future will tell if the partial plugging of the wells will be adequate. The minimum regulatory requirements of this section have been addressed.

ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES

Regulatory Reference: 30 CFR Sec. 701.5, 784.24, 817.150, 817.151; R645-100-200, -301-513, -301-521, -301-527, -301-534, -301-537, -301-732.

Analysis:**Reclamation**

Chapter 5, page 5-13, section **542.600 Roads** of the methane well submittal addresses this requirement. A road length of 55 feet will be developed for well G-1. A 370-foot road will be developed for road G-2; G-3 will require a ninety-foot section of road development. **542.600**

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states the following; “the access roads established during the drilling program will be reclaimed after methane extraction has been completed.” A reference is made to **Chapter 2**, section **242**; same is in reference to soils redistribution, which is not addressed by this section.

Retention

As mentioned elsewhere in this technical memorandum, the roads in place at the present time are the property of the heirs of the Milton and Ardith Thayn Trust. They will stay in place after the venting phase of the wells has been completed. The surface use agreement in place between Canyon Fuel Company and the Trust allows the permittee the use of the roads for the length of the agreement.

Findings:

The submitted information meets the minimum regulatory requirements of this section.

CONTEMPORANEOUS RECLAMATION

Regulatory Reference: 30 CFR Sec. 785.18, 817.100; R645-301-352, -301-553, -302-280, -302-281, -302-282, -302-283, -302-284.

Analysis:

General

Upon completion of the drilling phase of the well(s), approximately 60-70% of the disturbance(s) will be reclaimed by regrading that portion to approximate original contour, (See Chapter 5, page 5-14, section **553.100 Disturbed Area Backfilling and Grading, Approximate Original Contour**) roughening the area to enhance moisture retention and re-seeding the area with the seed mix approved by the Division. See page 5-9, Chapter 5, section **537.200, Regrading of Settled and Revegetated Fills**. As indicated, “upon completion of the well site, **the areas not required for the exhaust blower** will be regraded to approximate original contour”. If any settling should occur within the reshaped area, the permittee’s submittal makes the commitment to regrade the settled areas.

Findings:

The submitted information meets the minimum regulatory requirements.

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REVEGETATION

Regulatory Reference: 30 CFR Sec. 785.18, 817.111, 817.113, 817.114, 817.116; R645-301-244, -301-353, -301-354, -301-355, -301-356, -302-280, -302-281, -302-282, -302-283, -302-284.

Analysis:**Revegetation: General Requirements**

The submittal makes the commitment to reclaim as much of the area being disturbed as possible upon completion of the drilling phase of wells G-3, G-2, and G-1. A seed mix has been included as part of Chapter 3, page 3-12, **Table 3-2, Reclamation Seed Mix**. Roughening of the area will enhance moisture retention and promote new growth.

Revegetation: Timing

The submittal contains verbiage relative to the completion of all required reclamation activities upon the completion of topsoil replacement. (See section **354 Revegetation: Timing**, Chapter 3, page 3-13). All acreage associated with the methane vent wells will be reshaped to approximate original contour, roughened and revegetated to control erosion and promote the use of the area in accordance with the approved post mining land use.

Revegetation: Mulching and Other Soil Stabilizing Practices

Chapter 3, page 3-13, section **355 Revegetation: Mulching and Other Soil Stabilizing Practices** commits the permittee to the following, “mulch and/or soil stabilizing practices (roughening, etc.) will be used on all areas that have been regraded and covered by topsoil (Section **341.200**). Dugout Canyon Mine will exercise care to guard against erosion during and after application of topsoil”.

Findings:

The information submitted meets the minimum regulatory requirements.

MAPS, PLANS, AND CROSS SECTIONS OF RECLAMATION OPERATIONS

Regulatory Reference: 30 CFR Sec. 784.23; R645-301-323, -301-512, -301-521, -301-542, -301-632, -301-731.

Analysis:

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Affected Area Boundary Maps

The general location of the proposed wells is depicted on PLATE 1-4, which shows the permit boundary for the Dugout Canyon Mine. The proposed disturbance for each of the wells is depicted on FIGURE 1 for well G-1, FIGURE 5-5 for well G-2, and FIGURE 5-9 for well G-3. All figures are P.E. certified by a Utah registered professional engineer.

Bonded Area Map

The bonded area for each well is depicted by FIGURE 5-1 for G-1, FIGURE 5-5 for G-2 and FIGURE 5-9 for G-3.

Final Surface Configuration Maps

The permittee has committed to returning the drill pad areas to approximate original contour. Thus, the final surface configuration should very closely resemble the contours depicted on FIGURES 5-1, 5-5, and 5-9.

Certification Requirements.

All maps and drawings requiring certification as listed under R645-301-512 are P.E. certified by Mr. Layne Jensen, Utah registered professional engineer.

Findings:

The submitted information meets the minimum regulatory requirements of this section.

BONDING AND INSURANCE REQUIREMENTS

Regulatory Reference: 30 CFR Sec. 800; R645-301-800, et seq.

Analysis:

General

The permittee has submitted reclamation costs for the well sites. The following reclamation cost dollar amounts were determined from the provided information:

- 1) G-1 at an acreage of 0.6.....\$8729, including reseeding and pocking;
- 2) G-2 at an acreage of 1.21.....\$25,301, including reseeding and pocking;

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(Note: G-2 has a 370-foot roadway length requiring reclamation).

- 3) G-3 at an acreage of 0.97.....\$18,188, including reseeding and pocking.

Thus, the total dollar amount anticipated to reclaim the 2.78 acres associated with the three proposed well site is approximately \$52,000, or \$18,800 per acre. These figures include filling in the mud pit(s), back filling and grading the drill pad, plugging the well casing, spreading topsoil, pocking and reseeding, and removing the fencing upon Division approval of the reclamation. Managerial costs have also been included.

The reclamation cost figures have been reviewed by the Division and are determined to be adequate.

Findings:

The minimum regulatory requirements of R645-301-800, Et. Seq., have been met.

RECOMMENDATION:

The submittal meets the minimum regulatory requirements, and it should be approved.